N91-28269

ADVANCED LAUNCH SYSTEM

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THE CASE FOR TEAMING ON THE ALS-STME PROGRAM

PREPARED BY S.F.MOREA 6/20/90

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AGENDA

- BACKGROUND
- VIABILITY OF INDUSTRY COMPETITIVENESS
- POLICY
- ACQUISITION STRATEGY
  - PROCUREMENT OBJECTIVES
  - TEAMING BENEFITS
- CONCLUSION/SUMMARY

BACKGROUND

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ALS & STME SITUATION

- DOD BUDGET UNCERTAINTIES AND CUTS
  - PRECLUDES FY 92 ALS VEHICLE AND ENGINE FSD START
  - MAJOR CUTS TO VEHICLE STUDIES & NON PROP. ADP'S
- DOD & NASA HAVE AGREED TO PROCEED WITH A PROTOTYPE ENGINE PROGRAM IN FY-92
  - CONSISTENT WITH NASA ADV COMMITTEE RECOMMENDATIONS
  - CONSISTENT WITH DSB RECOMMENDATIONS
  - ENDORSED BY ALS SYSTEM CONTRACTORS
  - NASA CONSIDERING SIGNIFICANT BUDGET SUPPORT

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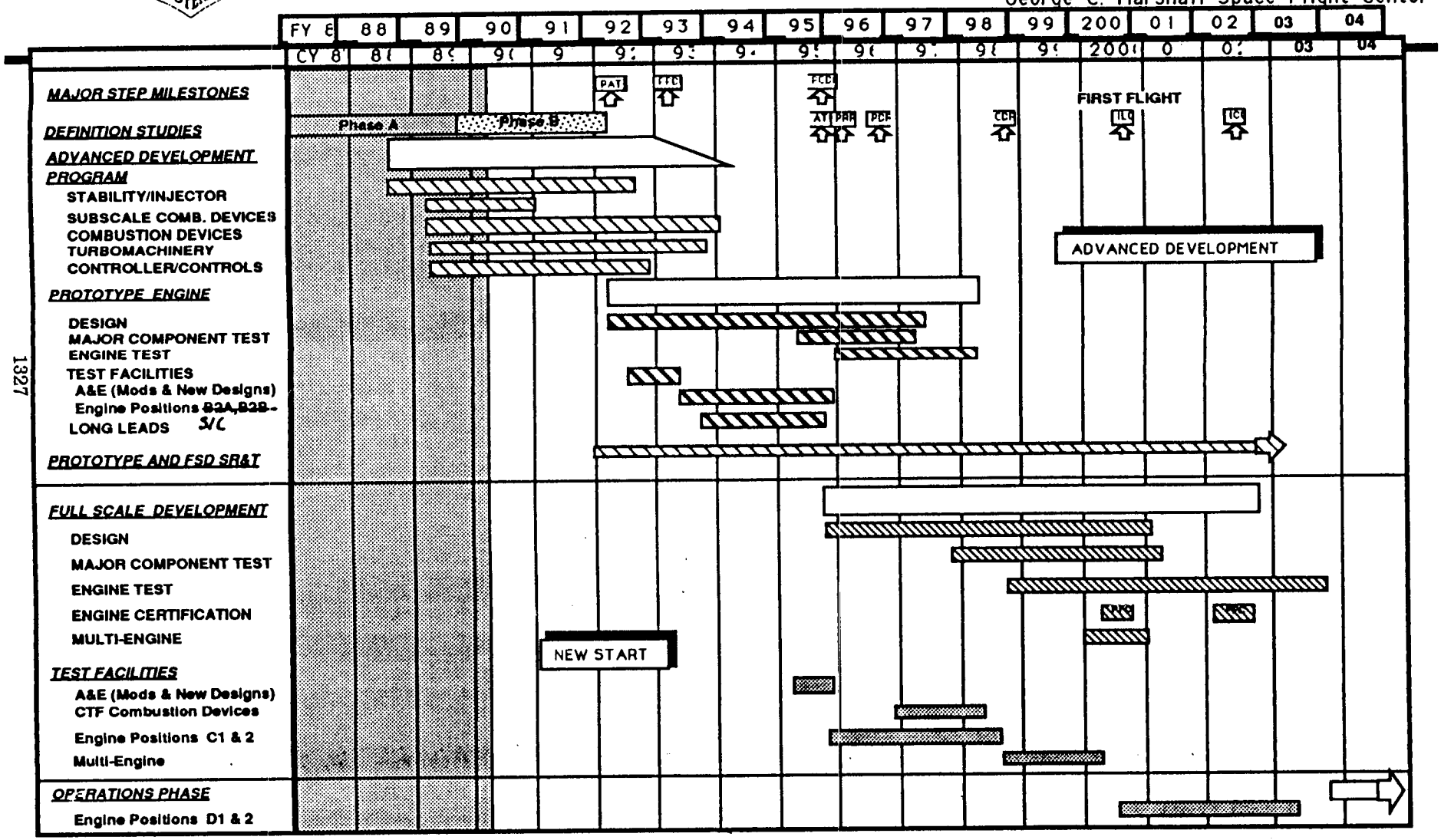

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VIABILITY OF THE ROCKET ENGINE INDUSTRY COMPETITIVENESS

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CONCERN

- USA COMPETITIVENESS IN LARGE LIQUID ROCKET ENGINES IN SERIOUS JEOPARDY
  - THIS NATION NO LONGER LEADS THE WORLD IN ROCKET ENGINE DEVELOPMENT
    - NEW LOX/LH2 ENGINES ARE UNDER DEVELOPMENT IN :
      - EUROPE (1st FLIGHT EXPECTED IN 1995)
      - JAPAN (1st FLIGHT EXPECTED IN 1995)
      - USSR (UNDER DEVELOPMENT SINCE MID 1980'S)
  - NO NEW LARGE ROCKET ENGINE DEV INITIATED IN USA SINCE 1970

LARGE LIQUID ROCKET ENGINE DEVELOPMENT PROGRAMS IN THE USA

ENGINE	THRUST	PROPELLANT	CONTRACTOR	APPLICATION	STATUS
S-3 (S-3D/E/F)	150K	LOX/KEROSENE	ROCKETDYNE	JUPITER THOR	DEV & PROD. COMP.1960
H-1	188K	LOX/RP-1	ROCKETDYNE	SATURN 1/1B	DEV & PROD. COMP.1961
F-1	1,500K	LOX/RP-1	ROCKETDYNE	SATURN V	DEV & PROD. COMP.1967
RL-10	15K	LOK/LH2	PRATT & WHITNEY	CENTAUR	D & P COMP 1963
RL-10-A3	16.5K			S-IV	D & P COMP 1964
RL-10-A3/3A	16.5K			ATLAS/TITAN	D & P COMP 1965
RL-10-A4	20.8K			ATLAS C	QUAL. COMP 1990
J-2	205K	LOX/LH2	ROCKETDYNE	S-II/S-IVB	D & P COMP 1966

* NOTE: THIS A STRICTLY COMMERCIAL ENGINE DEVELOPED FOR GENERAL DYNAMICS COMMERCIAL ATLAS/CENTAUR PROGRAM.

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LARGE LIQUID ROCKET ENGINE DEVELOPMENT PROGRAMS IN THE USA

ENGINE	THRUST	PROPELLANT	CONTRACTOR	APPLICATION	STATUS
M-1	1,500K	LOX/LH2	AEROJET	NOVA	DEV CANCELED 1967
LR-87	548K	STORABLES	AEROJET	TITAN (1ST STG)	PRODUCTION
LR-91	105K	STORABLES	AEROJET	TITAN (2ND STG)	PRODUCTION
SSME	470K	LOX/LH2	ROCKETDYNE	SHUTTLE	IN PRODUCT MPROVEMENT PHASE

CONCLUSION: COMPETITIVENESS OF THE THREE (3) LARGE LIQUID ENGINE CONTRACTORS IN THE USA SERIOUSLY ERODED SINCE THE 1960'S.

CONCERN

- COMPETITION WITHIN USA ON LARGE LIQUID ROCKET ENGINES IN SERIOUS JEOPARDY
  - OF THE THREE RECOGNIZED ENGINE PRIME CONTRACTORS...
    - ONLY TWO HAVE RECENT LOX/LH2 ENGINE DEV EXPERIENCE
    - ONLY ONE HAS LARGE LOX/LH2 SYSTEM LEVEL EXPERIENCE
  - OPPORTUNITIES FOR NEW ENGINE DEVELOPMENTS IN THE NEAR FUTURE ARE VERY LIMITED.

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CONCERN

- OPEN COMPETITION CAN BE DETRIMENTAL TO THE BEST INTERESTS OF THE GOVERNMENT UNDER CERTAIN CIRCUMSTANCES
  - WHERE BUDGETS DO NOT ALLOW FOR THE DEVELOPMENT OF MULTIPLE SOURCES AND ALTERNATE COMPETING DESIGNS , AND.....
  - WHERE VERY SMALL MARKETS EXISTS, AND.....
  - WHERE LIMITED QUALIFIED COMPETITORS EXIST.....
  - A SOLE SOURCE WILL RESULT !!!

POLICY

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POLICY

- **SUPPORT AND PROVIDE FOR THE LARGE LIQUID ROCKET ENGINE NEEDS OF THIS NATION**
  - MAINTAIN A VIGOROUS ROCKET ENGINE INDUSTRY IN THE USA FOR LARGE SIZE , LATEST TECHNOLOGY LIQUID ROCKET ENGINES.
    - KEEP USA FROM RELINQUISHING ITS PREEMINENCE IN LARGE LIQUID ROCKET ENGINES.
    - ALLOW USA TO BETTER COMPETE IN THE INTERNATIONAL COMMERCIAL ARENA.
    - AVOID POTENTIAL DEPENDENCY ON OTHER NATIONS FOR OUR NEXT GENERATION OF LARGE LIQUID ROCKET ENGINES.

POLICY SPECIFIC

- **CONDUCT AN STME PROTOTYPE ENGINE PROGRAM THAT:**
  - PROVIDES FOR THE LARGE LIQUID ROCKET ENGINE NEEDS OF THE NATION
  - MINIMIZES FULL SCALE DEVELOPMENT COST AND SCHEDULE OF NEXT GENERATION LARGE LIQUID ROCKET ENGINE
    - SIMILAR DOD/AF PROTOTYPE APPROACHES HIGHLY SUCCESSFUL (ie. F-16)
  - FACILITATES SYNERGISM BETWEEN THE PARTICIPATING CONTRACTORS TO OBTAIN THE BEST AND UNIQUE IDEAS, CAPABILITIES, AND TECHNOLOGIES LEADING TO THE BEST OVERALL DESIGN.
  - PRECLUDES A SINGLE CONTRACTOR FROM BECOMING A FUTURE "SOLE SOURCE".
    - AVOID A "WINNER TAKE ALL" PROCUREMENT APPROACH.

ACQUISITION STRATEGY

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PROCUREMENT OBJECTIVE

- IMPLEMENT TEAMING NOW ON THE EXISTING ARRAY OF PHASE B, AND ADP CONTRACTS.
  - TEAM AEROJET,PRATT & WHITNEY, AND ROCKETDYNE
  - USE TEAM TO FACILITATE ENGINE CYCLE DECISION
  - USE TEAM TO HELP RESTRUCTURE TOTAL PROGRAM TO ARRIVE AT AN INTEGRATED PLAN CONVERGING TO A PROTOTYPE ENGINE DESIGN.
- CONDUCT THE PROTOTYPE PROGRAM WITH TEAM OF THE 3 STME PRIME CONTRACTORS.
  - AWARD CONTRACT IN FY-92 TO TEAM OF AEROJET, PRATT & WHITNEY, AND ROCKETDYNE
  - PROTOTYPE PROVIDES PROOF OF CONCEPT

BENEFITS OF TEAMING"

- MAINTAINS A VIGOROUS INDUSTRY FOR LARGE LIQUID ROCKET ENGINES IN THE USA.
  - RETAINS USA'S PREEMINENCE AND LEADERSHIP IN THE FIELD
  - MAKES USA MORE COMPETITIVE IN THE INTERNATIONAL ARENA
  - AVOIDS SINGLE CONTRACTOR FROM BECOMING A SOLE SOURCE FOR LARGE LIQUID ROCKET ENGINES
- ENHANCES COMPETITION FOR THE FUTURE

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BENEFITS OF TEAMING (cont'd)

- WITHIN THE BUDGET CONSTRAINTS, TEAMING HAS THE POTENTIAL FOR THE BEST PRODUCT AT REDUCED DEVELOPMENT COSTS
  - SYNERGISM OF THE PRIME COMPANIES AND GOV'T WORK
  - AVOIDS CONTRACTORS WITHHOLDING BEST IDEAS AND TECHNOLOGIES BECAUSE OF THE COMPETITIVE ENVIRONMENT
    - ALLOWS BEST COMPONENT DESIGNS TO EMERGE WITHIN BEST ENGINE SYSTEM DESIGN
    - CONSISTENT WITH ALS TOTAL QUALITY MANAGEMENT REQ'T
    - ALLOWS EARLY CONVERGENCE TO A SINGLE ENGINE DESIGN
  - ELIMINATES DUPLICATION OF EFFORTS AT THE 3 CONTRACTORS

CONCLUSION/SUMMARY

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CONCLUSION/SUMMARY

- THE NATION NEEDS TO PROCEED WITH A NEW LOX/LH2 ROCKET ENGINE PROGRAM NOW !
- OPEN COMPETITION NOW WILL HAVE DELETERIOUS IMPACTS ON THE COMPETITIVE VIABILITY OF THE LIQUID ROCKET ENGINE INDUSTRY
- TEAMING PROVIDES A WAY TO SOLVE TODAYS CONCERNS WHILE ENHANCING THE OPTION FOR OPEN COMPETITION IN THE FUTURE